

NOTICE OF REVISION (NOR)		1. DATE (YYMMDD) 96-07-30		Form Approved OMB No. 0704-0188	
THIS REVISION DESCRIBED BELOW HAS BEEN AUTHORIZED FOR THE DOCUMENT LISTED.					
<small>Public reporting burden for this collection is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. PLEASE DO NOT RETURN YOUR COMPLETED FORM TO EITHER OF THESE ADDRESSED. RETURN COMPLETED FORM TO THE GOVERNMENT ISSUING CONTRACTING OFFICER FOR THE CONTRACT/ PROCURING ACTIVITY NUMBER LISTED IN ITEM 2 OF THIS FORM.</small>				2. PROCURING ACTIVITY NO.	
				3. DODAAC	
4. ORIGINATOR		b. ADDRESS (Street, City, State, Zip Code) Defense Supply Center Columbus 3990 East Broad Street Columbus, OH 43216-5000		5. CAGE CODE 67268	
a. TYPED NAME (First, Middle Initial, Last)				7. CAGE CODE 67268	
6. NOR NO. 5962-R166-96		8. DOCUMENT NO. 76016			
9. TITLE OF DOCUMENT MICROCIRCUIT, DIGITAL, BIPOLAR, LOW POWER SCHOTTKY TTL, MULTIPLEXER, MONOLITHIC SILICON			10. REVISION LETTER		11. ECP NO. NO REGISTERED USERS
			a. CURRENT F	b. NEW G	
12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES All					
13. DESCRIPTION OF REVISION					
<p>Sheet 1: Revisions ltr column; add "G". Revisions description column; add "Changes in accordance with NOR 5962-R166-96". Revisions date column; add "96-07-30". Revision level block; change from "F" to "G". Rev status of sheets; for sheet 1 and 4, change from "F" to "G".</p> <p>Sheet 4: Table I, Low Level input current, I_{IL}, delete and replace as follows:</p> <p>I_{IL1}, minimum limits column, delete "-0.005 mA". I_{IL2}, minimum limits column, delete "-0.002 mA". I_{IL2}, maximum limits column, change "-0.15 mA" to read "-0.2 mA". I_{IL3}, minimum limits column, delete "-0.100 mA". I_{IL3}, maximum limits column, change "-0.34 mA" to read "-0.4 mA".</p> <p>Sheet 4: Revision level block, change from "F" to "G".</p>					
14. THIS SECTION FOR GOVERNMENT USE ONLY					
a. (X one)	X	(1) Existing document supplemented by the NOR may be used in manufacture.			
		(2) Revised document must be received before manufacturer may incorporate this change.			
		(3) Custodian of master document shall make above revision and furnish revised document.			
b. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT DSCC-VAS			c. TYPED NAME (First, Middle Initial, Last) Raymond L. Monnin		
d. TITLE Chief, Microelectronics Branch		e. SIGNATURE Raymond L. Monnin		f. DATE SIGNED (YYMMDD) 96-07-30	
15a. ACTIVITY ACCOMPLISHING REVISION DSCC-VAS		b. REVISION COMPLETED (Signature) Larry E. Shaw		c. DATE SIGNED (YYMMDD) 96-07-30	

NOTICE OF REVISION (NOR) (See MIL-STD-480 for instructions) This revision described below has been authorized for the document listed.		DATE (YYMMDD) 92-02-21	Form Approved OMB No. 0704-0188																			
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1. ORIGINATOR NAME AND ADDRESS Defense Electronics Supply Center Dayton, Ohio 45444-5277		2. CAGE CODE 67268	3. NOR NO. 5962-R139-92																			
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6. TITLE OF DOCUMENT MICROCIRCUITS, DIGITAL, BIPOLAR, LOW POWER SCHOTTKY TTL, MULTIPLEXER, MONOLITHIC SILICON.		7. REVISION LETTER (Current) E	(New) F																			
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10. DESCRIPTION OF REVISION Sheet 1: Revisions ltr column; add "F". Revisions description column; add "Changes in accordance with NOR 5962-R139-92". Revisions date column; add "92-02-21". Sheet 4: Table I, Low level input current, I_{IL} , delete and replace as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td>Low level input current, data inputs</td> <td>I_{IL1}</td> <td rowspan="3" style="text-align: center;">$V_{CC} = 5.5 \text{ V}, V_{IL} = 0.4 \text{ V}$</td> <td>1, 2, 3</td> <td>-0.005</td> <td>-0.72</td> <td>mA</td> </tr> <tr> <td>Low level input current, enable inputs</td> <td>I_{IL2}</td> <td>1, 2, 3</td> <td>-0.002</td> <td>-0.15</td> <td>mA</td> </tr> <tr> <td>Low level input current, select inputs</td> <td>I_{IL3}</td> <td>1, 2, 3</td> <td>-0.100</td> <td>-0.34</td> <td>mA</td> </tr> </table> Sheet 4: Table I, t_{PHL1} , $C_L = 50 \text{ pF}$, subgroups 10 & 11, change maximum limit from "70 ns" to "75 ns". Sheet 6: Table I, t_{PZH1} , $C_L = 50 \text{ pF}$, subgroups 10 & 11, change maximum limit from "70 ns" to "75 ns". Sheet 8: Table I, t_{PLZ1} and t_{PLZ2} , $C_L = 50 \text{ pF}$, subgroup 9, change maximum limit from "30 ns" to "35 ns".				Low level input current, data inputs	I_{IL1}	$V_{CC} = 5.5 \text{ V}, V_{IL} = 0.4 \text{ V}$	1, 2, 3	-0.005	-0.72	mA	Low level input current, enable inputs	I_{IL2}	1, 2, 3	-0.002	-0.15	mA	Low level input current, select inputs	I_{IL3}	1, 2, 3	-0.100	-0.34	mA
Low level input current, data inputs	I_{IL1}	$V_{CC} = 5.5 \text{ V}, V_{IL} = 0.4 \text{ V}$	1, 2, 3	-0.005	-0.72		mA															
Low level input current, enable inputs	I_{IL2}		1, 2, 3	-0.002	-0.15		mA															
Low level input current, select inputs	I_{IL3}		1, 2, 3	-0.100	-0.34	mA																
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b. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT DESC-ECC	SIGNATURE AND TITLE Monica L. Poelking Chief, Custom Microelectronics		DATE (YYMMDD) 92-02-21																			
12. ACTIVITY ACCOMPLISHING REVISION DESC-ECC	REVISION COMPLETED Phu Nguyen		DATE (YYMMDD) 92-02-21																			

REVISIONS																			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED																
E	Delete vendors, CAGE 34335, CAGE 07263, CAGE 27014, and CAGE 18324. Add logic diagram. Table I, change $I_{OS(min)}$ from -6 tp -15. Table I, change the following from ($C_L = 50$ pF, subgroups 10 and 11): t_{PLH1} and t_{PHZ1} from 70 ns to 57 ns. t_{PHL2} and t_{PLH2} from 53 ns to 57 ns. t_{PHL3} and t_{PLH3} from 46 ns to 30 ns. t_{PZL1} and t_{PZL2} from 63 ns to 68 ns. t_{PZH2} from 45 ns to 48ns. t_{PLZ1} and t_{PLZ2} from 42 ns to 45 ns. t_{PHZ2} from 84 ns to 90 ns. Editorial changes throughout change Code Ident. No. to 67268. Revise to military drawing format.	06 Oct 1987	R. P. Evans																
CURRENT CAGE CODE 67268																			
REV																			
SHEET																			
REV																			
SHEET																			
REV STATUS OF SHEETS				REV		E	E	E	E	E	E	E	E	E	E	E	E	E	
				SHEET		1	2	3	4	5	6	7	8	9	10	11	12	13	
PMIC N/A				PREPARED BY Monica L. Groesel				DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444											
STANDARD MICROCIRCUIT DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A				CHECKED BY D. A. DiCenzo															
				APPROVED BY Robert P. Evans															
				DRAWING APPROVAL DATE 23 MARCH 1976															
								REVISION LEVEL E				SIZE A	CAGE CODE 14933		76016				
								SHEET 1 OF 13											

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:

76016	01	E	X
Drawing number	Device type (1.2.1)	Case outline (1.2.2)	Lead finish per MIL-M-38510

1.2.1 Device type. The device type shall identify the circuit function as follows:

Device type	Generic number	Circuit
01	54LS251	Data selector/multiplexer with 3-state outputs

1.2.2 Case outlines. The case outlines shall be as designated in appendix C of MIL-M-38510, and as follows:

Outline letter	Case outline
E	D-2 (16-lead, 1/4" x 7/8"), dual-in-line package
F	F-5 (16-lead, 1/4" x 3/8"), flat package

1.3 Absolute maximum ratings.

Supply voltage range	-0.5 V dc to +7.0 V dc
Input voltage range	-1.5 V dc at -18 mA to +5.5 V dc
Storage temperature range	-65° C to +150° C
Maximum power dissipation (P_D) per device ^{1/}	66 mW
Lead temperature (soldering, 10 seconds)	+300° C
Thermal resistance, junction-to-case (O_{JC}):	
Cases E and F	See MIL-M-38510, appendix C
Junction temperature (T_J)	+175° C

1.4 Recommended operating conditions.

Supply voltage (V_{CC})	4.5 V dc minimum to 5.5 V dc maximum
Minimum high level input voltage (V_{IH})	2.0 V dc
Maximum low level input voltage (V_{IL})	0.7 V dc
Case operating temperature range (T_C)	-55° C to +125° C

^{1/} Must withstand the added P_D due to short circuit test (e.g., I_{OS}).

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2. APPLICABLE DOCUMENTS

2.1 Government specification and standard. Unless otherwise specified, the following specification and standard, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of the specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.2 Truth table. The truth table shall be as specified on figure 2.

3.2.3 Logic diagram. The logic diagram shall be as specified on figure 3.

3.2.4 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

3.3 Electrical performance characteristics. Unless otherwise specified, the electrical performance characteristics are as specified in table I and apply over the full recommended case operating temperature range.

3.4 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in 6.4 herein.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
High level output voltage	V _{OH}	V _{CC} = 4.5 V V _{IH} = 2.0 V I _{OH} = -1.0 mA V _{IL} = 0.7 V	1, 2, 3	2.4		V
Low level output voltage	V _{OL}	V _{CC} = 4.5 V V _{IH} = 2.0 V I _{OL} = 4.0 mA V _{IL} = 0.7 V	1, 2, 3		0.4	V
Input clamp voltage	V _{IC}	V _{CC} = 4.5 V; I _{IN} = -18 mA	1		-1.5	V
High level input current	I _{IH1}	V _{CC} = 5.5 V V _{IH} = 2.7 V	1, 2, 3		20	μA
	I _{IH2}	V _{CC} = 5.5 V V _{IH} = 5.5 V	1, 2, 3		100	μA
Off-state output current	I _{O(off)}	V _{CC} = 5.5 V V _{OUT} = 2.4 V	1, 2, 3		20	μA
		V _{IH} = 2.0 V V _{OUT} = 0.4 V	1, 2, 3		-20	μA
Low level input current	I _{IL}	V _{CC} = 5.5 V V _{IL} = 0.4 V	1, 2, 3		-0.4	mA
Short-circuit output current	I _{OS}	V _{CC} = 5.5 V V _{OUT} = 0.0 V 1/	1, 2, 3	-15	-130	mA
Supply current	I _{CC}	V _{CC} = 5.5 V, enable grounded	1, 2, 3		10	mA
		V _{CC} = 5.5 V, strobe at 4.5 V	1, 2, 3		12	mA
Functional tests		See 4.3.1c	7			
Propagation delay time, A, B, or C (4 levels) to Y	t _{PHL1}	V _{CC} = 5.0 V R _L = 2 kΩ ±5% 2/	C _L = 15 pF ±10%	9	45	ns
				10, 11	63	
			C _L = 50 pF ±10%	9	50	
				10, 11	70	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C unless otherwise specified		Group A subgroups	Limits		Unit	
					Min	Max		
Propagation delay time, A, B, or C (4 levels) to Y	t _{PLH1}	V _{CC} = 5.0 V R _L = 2 kΩ ±5% 2/	C _L = 15 pF ±10%	9		45	ns	
				10, 11		63		
			C _L = 50 pF ±10%	9		50		
				10, 11		75		
Propagation delay time, A, B, or C (3 levels) to W	t _{PHL2}			C _L = 15 pF ±10%	9		33	ns
					10, 11		46	
				C _L = 50 pF ±10%	9		38	
					10, 11		57	
	t _{PLH2}			C _L = 15 pF ±10%	9		33	ns
					10, 11		46	
				C _L = 50 pF ±10%	9		38	
					10, 11		57	
Propagation delay time, any D to Y	t _{PHL3}			C _L = 15 pF ±10%	9		28	ns
					10, 11		39	
				C _L = 50 pF ±10%	9		33	
					10, 11		50	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C unless otherwise specified	Group A subgroups	Limits		Unit	
				Min	Max		
Propagation delay time, any D to Y	t _{PLH3}	V _{CC} = 5.0 V R _L = 2 kΩ ±5% 2/	C _L = 15 pF ±10%	9		28	ns
				10, 11		39	
			C _L = 50 pF ±10%	9		33	
				10, 11		50	
Propagation delay time, any D to W	t _{PHL4}		C _L = 15 pF ±10%	9		15	ns
				10, 11		21	
			C _L = 50 pF ±10%	9		20	
				10, 11		30	
	t _{PLH4}	C _L = 15 pF ±10%	9		15	ns	
			10, 11		21		
		C _L = 50 pF ±10%	9		20		
			10, 11		30		
Output enable time, strobe to Y	t _{PZH1}	C _L = 15 pF ±10%	9		45	ns	
			10, 11		63		
		C _L = 50 pF ±10%	9		50		
			10, 11		70		

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C unless otherwise specified		Group A subgroups	Limits		Unit	
					Min	Max		
Output enable time, strobe to Y	t _{PZL1}	V _{CC} = 5.0 V R _L = 2 kΩ ±5% 2/	C _L = 15 pF ±10%	9		40	ns	
				10, 11		56		
			C _L = 50 pF ±10%	9		45		
				10, 11		68		
Output enable time, strobe to W	t _{PZH2}			C _L = 15 pF ±10%	9		27	ns
					10, 11		38	
				C _L = 50 pF ±10%	9		32	
					10, 11		48	
	t _{PZL2}			C _L = 15 pF ±10%	9		40	ns
					10, 11		56	
				C _L = 50 pF ±10%	9		45	
					10, 11		68	
Output disable time from strobe to Y	t _{PHZ1}			C _L = 15 pF ±10%	9		45	ns
					10, 11		63	
				C _L = 50 pF ±10%	9		50	
					10, 11		75	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55^{\circ}\text{C} \leq T_C \leq +125^{\circ}\text{C}$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Output disable time from strobe to Y	t_{PLZ1}	$V_{CC} = 5.0\text{ V}$ $R_L = 2\text{ k}\Omega \pm 5\%$ 2/	$C_L = 15\text{ pF} \pm 10\%$	9		25
				10, 11		35
			$C_L = 50\text{ pF} \pm 10\%$	9		30
				10, 11		45
Output disable time from strobe to W	t_{PHZ2}		$C_L = 15\text{ pF} \pm 10\%$	9		55
				10, 11		77
			$C_L = 50\text{ pF} \pm 10\%$	9		60
				10, 11		90
	t_{PLZ2}		$C_L = 15\text{ pF} \pm 10\%$	9		25
				10, 11		35
			$C_L = 50\text{ pF} \pm 10\%$	9		30
				10, 11		45

1/ Not more than one output should be shorted at a time, and the duration of the short circuit condition should not exceed one second.

2/ Propagation delay time testing may be performed using either $C_L = 15\text{ pF}$ or $C_L = 50\text{ pF}$. However, the manufacturer must certify and guarantee that the microcircuits meet the switching test limits specified for a 50 pF load.

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3.5 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in 6.4. The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall state that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.6 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.7 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.8 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

a. Burn-in test (method 1015 of MIL-STD-883).

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(2) $T_A = +125^\circ\text{C}$, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, 6, and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 7 tests shall verify the truth table.

4.3.2 Groups C and D inspections.

a. End-point electrical parameters shall be as specified in table II herein.

b. Steady-state life test (method 1005 of MIL-STD-883) conditions:

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(2) $T_A = +125^\circ\text{C}$, minimum.

(3) Test duration: 1,000 hours, except as permitted by appendix B of MIL-M-38510 and method 1005 of MIL-STD-883.

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CASES E AND F

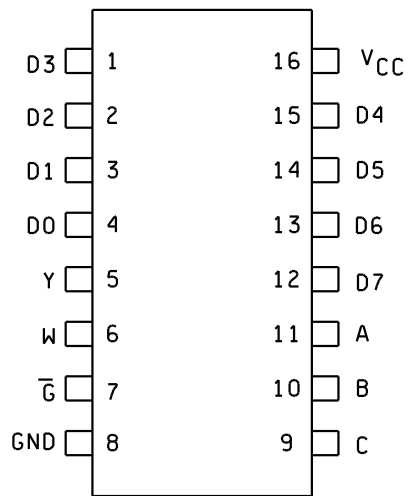


FIGURE 1. Terminal connections.

INPUTS				OUTPUTS	
SELECT			ENABLE \bar{G}	Y	W
C	B	A			
X	X	X	H	Z	Z
L	L	L	L	D0	$\bar{D}0$
L	L	H	L	D1	$\bar{D}1$
L	H	L	L	D2	$\bar{D}2$
L	H	H	L	D3	$\bar{D}3$
H	L	L	L	D4	$\bar{D}4$
H	L	H	L	D5	$\bar{D}5$
H	H	L	L	D6	$\bar{D}6$
H	H	H	L	D7	$\bar{D}7$

H = high logic level, L = low logic level
X = irrelevant, Z = the high impedance (off)
D0, D1 ... D7 = the level of the respective D input

FIGURE 2. Truth table.

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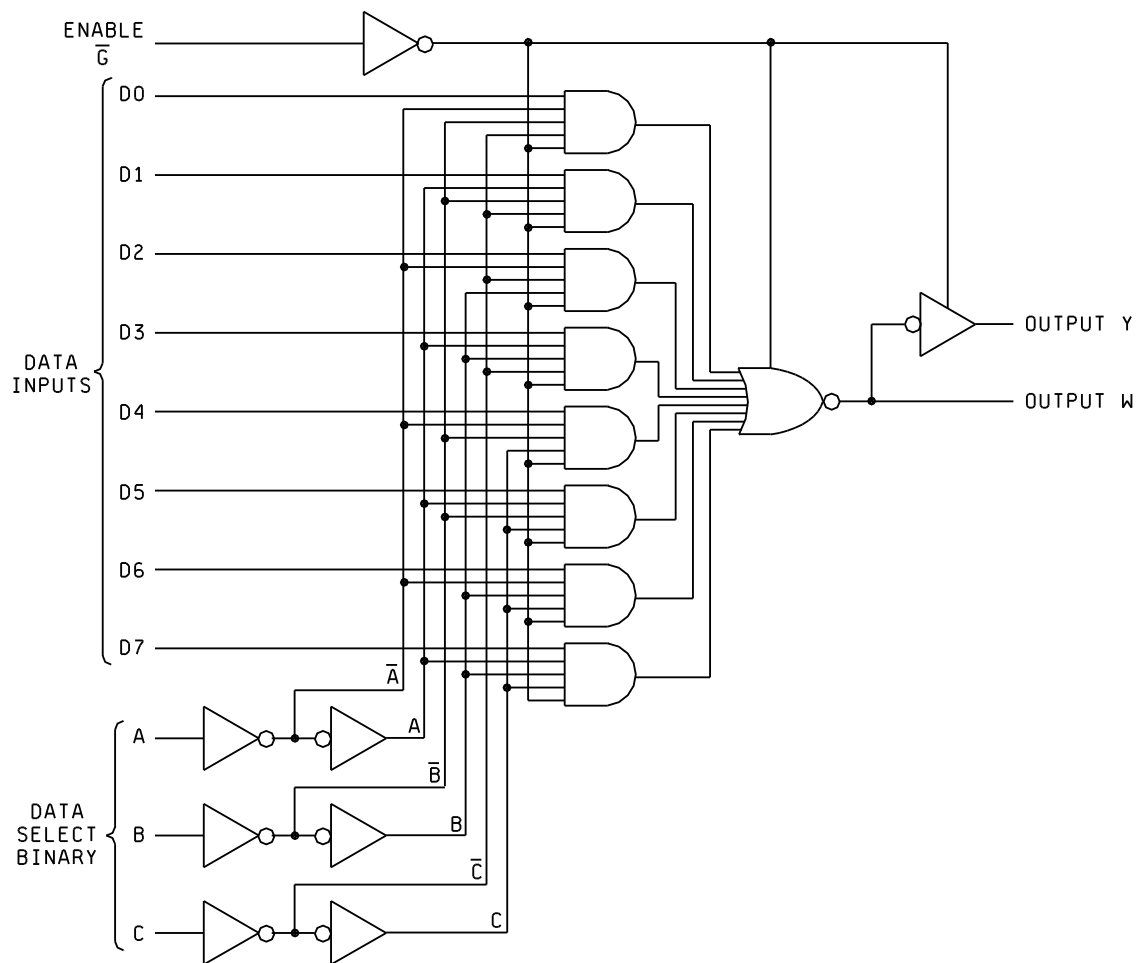


FIGURE 3. Logic diagram.

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TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	---
Final electrical test parameters (method 5004)	1*, 2, 3, 9
Group A test requirements (method 5005)	1, 2, 3, 7, 9, 10**, 11**
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3

* PDA applies to subgroup 1.

** Subgroups 10 and 11, if not tested, shall be guaranteed to the specified limits in table I.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Replaceability is determined as follows:

- a. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.
- b. When a QPL source is established, the part numbered device specified in this drawing will be replaced by the microcircuit identified as part number M38510/30905B--.

6.3 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone 513-296-5375.

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6.4 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. The vendors listed herein have agreed to this drawing and a certificate of compliance (see 3.5 herein) has been submitted to DESC-ECS.

Military drawing part number	Vendor CAGE number	Vendor similar part number <u>1/</u>	Replacement military specification part number
7601601EX <u>2/</u>	04713 01295	54LS251/BEAJC SNJ54LS251J	M38510/30905BEX
7601601FX <u>2/</u>	04713 01295	54LS251/BFAJC SNJ54LS251W	M38510/30905BFX

1/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

2/ Inactive for new design. Use QPL-38510 product.

Vendor CAGE
number

04713

01295

Vendor name
and address

Motorola, Incorporated
7402 South Price Road
Tempe, AZ 85283

Texas Instruments, Incorporated
P.O. Box 6448
Midland, TX 79701

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